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**NORTHEAST REGION  
SUSTAINABLE AGRICULTURE  
RESEARCH AND EDUCATION**

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aS441  
.S878

# 1995 Progress Report



**Working to support agricultural production,  
processing and marketing systems that sustain  
rural communities and connect them with the  
region's urban and suburban areas.**

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# SARE & ACE: An Overview

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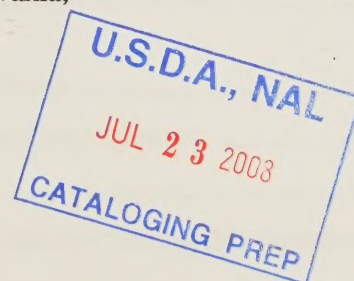
**T**he USDA-Sustainable Agriculture Research and Education (SARE) Program is a federal competitive grants program with regional leadership and decision making. SARE's mission is to increase knowledge that helps farmers adopt production and marketing practices that are profitable, environmentally sound and beneficial to local communities and society in general.

To accomplish these goals, the program places special emphasis on whole-farm systems research, including the profitability of alternative production and marketing methods. The program also funds experimental component research, exploratory research, demonstrations, educational projects and in-service or professional development projects. SARE provides funding for projects carried out by scientists, producers, educators and private sector representatives.

Authorized by the 1985 and 1990 Farm Bills, SARE was first funded in 1988. It is administered through the USDA Cooperative Research, Education and Extension Service. Nationally, the 1995 allocation was approximately \$11 million.

**Agriculture in Concert with the Environment (ACE)** is a joint EPA-SARE program. Launched in 1991, it focuses on protecting environmentally sensitive areas, preventing agricultural pollution and reducing the misuse of pesticides and other agricultural chemicals.

The Northeast region includes Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia and Washington, D.C.



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# SARE & ACE: An Overview

The SARE/ACE program is a federal initiative to support research and extension projects in the field of agricultural and forest systems. The program is designed to provide a national network of research and extension projects that will address the needs of the agricultural and forest sectors. The program is managed by the National SARE/ACE Program Office, which is located in the Department of Agriculture, Forest Service, Northeast Forestry Experiment Station, New York State Office, New York.

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# 1995 Awards

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**I**n 1995, the Northeast SARE and ACE programs awarded a record \$2.2 million in grants to research, education and training projects designed to help sustain agriculture throughout the 12-state region. Roughly \$1.63 million was awarded to 19 new and three ongoing SARE and ACE research and education projects. Through the Northeast's three-year-old Farmer/Grower Program, the region awarded \$95,838 to 38 producer-managed projects.

The region also awarded \$487,074 to nine projects through which Extension personnel and other agricultural professionals will learn about sustainable agriculture concepts and practices, and how to transfer that knowledge to producers. Also, \$143,000 was earmarked to help support state training efforts.

The funded projects were selected on a competitive basis from 74 research and education proposals, 154 producer applications and 10 training proposals. As in the past, the projects selected for funding should help develop farm practices that make economic and environmental sense. This year's projects address dairy, sheep, fruit, vegetable, and ornamental plant production and marketing systems.

New in 1995 were three projects that focus on marketing strategies. A New York team will investigate opportunities to enhance farm income and rural employment through small-scale food processing. Two other projects will study and attempt to enhance the viability of Community Supported Agriculture (CSA) operations in the region.

CSAs are sometimes called subscription farms because consumers purchase shares of the harvest at the beginning of the season in return for a weekly produce pick-up. Over the last five to eight years, there has been an explosion of producer — and consumer — interest in CSAs throughout the country but little study of them.

“One of the things that (these projects) are trying to do is look at economics of CSAs and provide help to people who want to start one up,” says Regional Coordinator Frederick Magdoff. While CSAs are a small part of the regional food system, Magdoff says they may address some issues key to sustaining agriculture in the Northeast: providing working capital when farms need it, guaranteeing markets, and renewing direct connections between producers and consumers.

This year's ACE-supported projects take aim at some of the region's most problematic pests - but through integrated strategies that rely on biological controls and reduced-toxicity pesticides. Some will explore alternative controls for pesticide-resistant strains, while others are testing alternatives for environmentally harsh pesticides that may not be available or effective in the

*Several projects  
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and consumers.*

*This year's  
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most problematic  
pests.*

future.

SARE funding will support several new livestock-related projects, including three that are exploring alternative waste, parasites, and pasturing strategies in dairy production systems. Also funded was a broad-based effort to develop curriculum for Ag in the Classroom programs.

Significant funding was allocated this year to three ongoing projects, including a five-state effort to develop sustainable apple production systems for the Northeast and a multi-disciplinary vegetable production system.

Nationally, 1995 funding for the SARE and ACE programs was about 10 percent more than in 1994.

"Even though SARE is just a small part of the national agriculture budget, the fact that there was increased funding in a time of scarce resources indicates support for the program by the USDA, the administration and especially Congress," Magdoff said. "SARE is helping people and addressing important questions."

# Development of a Sustainable Apple Production System for the Northeast

Fruit

*Using apple scab-resistant cultivars and integrated pest management techniques, researchers will continue developing and testing sustainable apple production systems in five Northeast states.*

### Abstract

Work on developing sustainable apple production systems for the Northeast continues in this multidisciplinary project involving over a dozen research and extension personnel and over two dozen growers across five states. All of the activities focus on developing or demonstrating advanced integrated pest management (IPM) techniques, many of which emphasize the use of scab-resistant apple cultivars (SRCs) and biologically intensive IPM methods. This document summarizes a number of key findings and project activities conducted during the past year in the areas of horticultural and pest management, economics and outreach/information dissemination.

**Horticultural Management:** The winter hardiness of trees and taste of fruit, of SRCs seem to be at least as good as standard cultivars and the SRCs Liberty, Enterprise and Goldrush have been particularly noteworthy in their performance to date. Potential problems requiring further observation have been noted for one root stock (Mark) and on fruit of two advanced selections (NY75441-67 and NY74828-12).

**Pest Management — Diseases:** Based on recent observations and experiments several areas that warrant further investigation include: the potential for decreasing the severity of apple replant disease with the use of marigold as a cover crop or incorporation of peat moss into planting holes; the significance of leaf spots induced by cedar apple rust on SRCs initially considered resistant to this disease; and the control of flyspeck and other summer diseases in orchards receiving few or no fungicides.

**Pest Management — Arthropods:** Progress continues to be made toward insect and mite pest control methods that combine decreased pesticide use with sanitation, mating disruption, ground cover management, natural and introduced biological controls,

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### Participants:

Cornell University  
Rodale Institute  
Rutgers University  
University of Massachusetts  
University of Vermont  
Apple growers in New York,  
New Jersey, Pennsylvania and  
Vermont

### SARE/ACE grants:

\$280,842

### Matching funds:

\$191,074

### Project numbers:

LNE88-01 & ANE92.16



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**Project numbers:**

LNE88-01 &  
ANE92.16.

and perimeter trap-out methods. Most of the continued insecticide use is driven by the need to control certain early-season pests across the region and some later-season pests in southern locations of the region.

**Economics:** One on-farm case study in an SRC block resulted in 1/4 the pesticide use and 1/3 the pesticide expense compared to the average IPM program on standard apple cultivars; this observation will need to be verified in subsequent seasons. Industry-level simulation analysis studied the effect of fresh export levels, imported juice prices, and wholesale prices on commodity prices.

**Outreach/Information Dissemination:**

Fifty-nine growers, industry representatives, extension personnel, and researchers from all related disciplines gathered from 14 states and two Canadian provinces for two days to discuss the latest information on the horticultural, pest management and marketing aspects of scab-resistant apple cultivars. Circulation for the Northeast SARE Sustainable Apple Production Newsletter stands at 1,135 and 800 copies of the *Management Guide for Low- Input Sustainable Apple Production* have been sold to date. Other outreach activities included over 60 events (27-on farm) with attendance exceeding 12,000; 12 professional meeting presentations; and 26 publications.

# Toward Biotoxicant Management of Key Summer Apple Pests

## Fruit

*Working in commercial apple orchards, this project will evaluate alternative control measures for apple maggot flies, flyspeck and sooty blotch. Participants will evaluate odor-baited toxicant treated spheres (as a replacement for organophosphate insecticide sprays) and potassium bicarbonate and calcium chloride as replacements for environmentally harsh fungicides benomyl and captan.*

### Abstract

In a pilot project in Massachusetts commercial apple orchards from 1991-1994, we evaluated alternatives to application of insecticide and fungicide sprays in orchard blocks from mid-June through harvest in September. After mid-June, one insect pest (apple maggot) and two disease pests (flyspeck and sooty blotch) caused the most injury to fruit in pilot-project blocks as well as nearby grower-managed, pesticide-treated blocks. Our pilot-project technique of controlling apple maggot flies with odor-baited sticky red spheres provided good control but required too much labor to merit recommendation for grower use. Here, we propose to evaluate in commercial orchards odor-baited toxicant treated spheres as a substitute for sticky spheres and as a replacement for organophosphate insecticide sprays for control of this key summer insect pest. Our pilot-project technique of controlling flyspeck and sooty blotch through summer pruning of trees and frequent mowing of understory growth to reduce tree canopy humidity proved only mildly successful. Here, we propose to evaluate in commercial orchards potassium bicarbonate and calcium chloride as benign replacement fungicides for the environmentally harsh organic fungicides benomyl and captan presently needed for effective control of these two key summer disease pests. If the trials proposed here prove successful, then the door will be open to apple growers throughout New England and eastern New York to stop spraying insecticide and harsh fungicide in apple orchards after mid-June.

### Project coordinator:

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### Participants:

Seven Massachusetts apple  
growers  
University of Massachusetts

### ACE grant:

\$35,175

### Non-federal match:

\$13,349

### Project number:

ANE95.25



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**Project number:**  
ANE95.25

This should result in much less (if any) detectable residue on harvested fruit, a major reduction in drift of pesticides into areas neighboring orchards, and a buildup of natural enemies of key pests of apple foliage.

**Objectives**

Our goal is to replace all insecticide and environmentally harsh organic fungicide sprays in Massachusetts commercial apple orchards from early June through harvest with non-traditional chemical pest control alternatives. We aim to make substantial progress toward achieving this goal through the two objectives of this proposal.

1. Evaluation in commercial orchards of odor-baited, toxicant-treated spheres as a replacement for organophosphate insecticide for control of apple maggot flies, the principal fruit-damaging insect pest active after mid-June.
2. Evaluation in commercial orchards of potassium bicarbonate and calcium chloride as benign replacements for the harsh fungicides benomyl and captan for control of fly-speck and sooty blotch, the principal fruit-damaging disease pests active after mid-June.

# Biopesticidal Strategies for Insect Management in Cranberry

Fruit

*This project targets most insect pests in Massachusetts cranberry production—the scarab root grubs and foliage and fruit-feeding Lepidoptera—with the goal of reducing dependence on organophosphates and carbamates. Participants will work on alternative controls, including sex pheromone-based monitoring traps, Bts, and nematode products for management of larval populations.*

## Abstract

In cranberry, the research base is poor and most aspects of insect biology and management remain to be studied. Good alternatives to insecticides are not available for the majority of key pests, and insecticide use is a major issue. In addition to challenges faced by most growers, such as insecticide resistance and crop residues, cranberry is grown in wetland habitats where extensive usage of redirected surface waters is required for cultivation. When biorational tools become available, the cranberry industry provides a unique opportunity for implementation. As a result of mounting external pressures, growers are open to alternatives. The grower-owned cooperative, Ocean Spray Cranberries, as well as an existing crop consultant network allows a unique interface and communication link between university researchers and the preponderance of growers. Finally, the high value of the crop and the fact that the majority of growers own small acreages are particularly favorable traits for rapid implementation of more costly or labor-intensive biopesticidal approaches.

In this project we propose to target the majority of insect pests in Massachusetts cranberry production, which are contained within two complexes—the scarab root grubs and the foliage and fruit-feeding Lepidoptera. Massachusetts growers view the scarab grub complex as the industry's worst pests owing to the recent rapid increase in the number of infestations and the fact that no controls are available. We propose to continue ongoing

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## Participants:

University of Massachusetts  
Cornell University  
Ocean Spray Cranberries

## ACE Grant:

\$39,996

## Matching funds:

\$24,180

## Project number:

ANE95.24



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**Project number:**  
ANE95.24

work to develop sex pheromone-based monitoring traps for four scarab species, allowing detection and identification of this difficult group as well as mass trapping techniques. B.t., IGR, and nematode products for management of larval populations will be screened in lab and field trials. In addition, seven species of lepidoptera create widespread pest pressure. We propose work that will result in greater integration of B.t.-based products as well as to initiate evaluation of an IGR. For a number of pests, the tools developed and knowledge gained as a result of our proposed work could be transferred to both NJ and WI. Lowered dependence on organophosphates and carbamates is key to the long-term health of this industry.

Together, MA, WI, and NJ represent almost 90 percent of the world's cranberry production. The cranberry industry provides a unique opportunity for implementation of biorational tools.

First, Massachusetts cranberry growers generally feel challenged from many directions, including issues regarding wetlands, water quality, food safety and pesticide reregistrations. They work in one of the fastest growing areas of the country and seek to minimize conflicts with neighbors. They realize the precarious nature of their position, producing crops in environ-

mentally sensitive areas with large amounts of water, and as a result are open to alternatives.

Second, the cranberry industry has a close research, extension and grower community. A grower-owned cooperative (Ocean Spray Cranberries) accounts for the majority of acreage in MA, as well as in all other growing areas. This allows a unique interface and communication link between University researchers and the preponderance of growers.

Third, Integrated Pest Management (IPM) guidelines, which consist of crop phenology observations, sex pheromone trap monitoring, and sampling of insect pests to trigger insecticide sprays (Lasota 1990), are utilized on 80 percent of Massachusetts acreage (Mahr and Moffitt 1994). Of this acreage, half is under programs provided by private consultants. These consultants should provide growers with a more precise, and thus, successful introduction of biopesticide options, which frequently require a greater information base to implement.

Finally, the crop has a high value (average = \$7,500/acre) and the majority of growers (80 percent) own fewer than 20 acres of cranberry. Together, these latter two traits are favorable for implementation of more costly or labor-intensive biopesticidal approaches.

# Improving the Profitability and Adaptation of the High-Density Strawberry Production System for the Northeast

Fruit

*University and industry cooperators will develop and test adapted, pest-resistant cultivars in a high-density strawberry production system that uses composts and alternative pest management techniques.*

### Abstract

As the agricultural value of land in the Northeast continues to loose the battle against the real estate development value of the land, the agribusiness industry is turning to high-efficiency production systems that allow maximum profitability from the land. Increasing the profitability and geographic adaptability of the high-density strawberry production system is the major objective of this multi-state study, which includes university and industry cooperators.

This project involves research to fine tune a production system that utilizes the maximum productive efficiency of the strawberry plant. Specifically, the proposal includes developing/testing adapted, pest-resistant cultivars to replace the cultivar Chandler, which is highly productive but susceptible to the major diseases found in the Northeast.

Various compost types will be tested as replacements for synthetic fertilizer. Plant type and planting date will be optimized in keeping with systems that will benefit the commercial nursery industry. The latest pest management techniques will be integrated, including exclusion/avoidance of insects utilizing floating row covers. The system will be compared side-by-side to the matted-row system for profitability, and to demonstrate it to commercial growers.

Rapid dissemination of information is an integral part of the project, including immediate hands-on exposure of commercial demonstrations. The extension effort will include farm tours and presentations at annual meetings. Fact sheets on preparation and economics will be prepared, and a chapter will be included in the NRAES Strawberry Production Manual. This two-year proposal is the preliminary project for the subsequent proposal which will include New Jersey, Maryland, Pennsylvania, New York and

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### Participants:

Rutgers University  
University of Maryland  
Farmers

### Grant:

\$96,204 for two years

### Non-federal matching funds:

\$125,748

### Project number:

LNE95-57



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**Project number:**  
LNE95-57

Maine in production and pest management experiments. Cooperators have been contacted and preliminary sites established.

**Objectives:**

- 1) Optimize an integrated strawberry production system, involving genetic, cultural and environmental aspects, with improved profitability and decreased pesticide dependence. Investigate the influence of location, planting date, plant type and floating row covers (FRC) utilization on earliness, productivity, quality and profitability.
- 2) Compare selections (NJUS and MDUS Strawberry Breeding Programs) and eastern adapted cultivars to Chandler for pest resistance, earliness, productivity and quality. Study the efficacy of composted horse manure and chicken parts compost

as a primary nutrient source and/or replacement for fumigation, and test recyclable plastics. Study double-cropping strategies with vegetables and/or renovation practices for maintaining the strawberry planting for a second production year.

- 3) Extend research and development information on the system to encourage rapid commercial adoption. Present details of the system and results at local, statewide, regional, and national small fruit and vegetable meetings, conduct field days and on-farm meetings to discuss commercial demonstrations. Document details of the system and results into fact sheets, newsletters and a chapter in the NRAES Strawberry Production Guide currently in preparation.

# Developing Sustainable Management Tactics for Cucumber Beetles in Cucurbits

Vegetable Systems

*Through this comprehensive effort to develop environmentally benign control tactics for cucumber beetles on cucumbers, melons and squash, participants will replace or minimize pesticide inputs through the use of cultural and biological tactics. Goals include reducing pesticide and labor costs associated with spraying and improving crop yields and quality.*

### Abstract

There is a critical need to develop alternatives to conventional insecticides. Many insect species are now resistant to insecticides, environmental and health hazards exist, and there are adverse effects on nontarget organisms. For vegetables, such as cucurbits, the need for alternatives may be more acute than for other commodities because they are considered minor crops and new insecticides are less likely to be registered. Also, vegetable growers, especially fresh market producers, are highly visible to the public and the application of a pesticide is most often perceived as dangerous by nonagriculturists. Alternatives that would reduce pesticide use could help alleviate these conflicts.

The cucurbits (cucumber, melon, squash, etc.), an exceptionally diverse and valuable commodity grown in the northeast and across the US, are plagued by cucumber beetles. These are very serious pests that can destroy entire plantings of cucurbits and, consequently, many growers treat them with insecticides on a weekly schedule. Organic growers rank them as the most important insect pest of cucurbits in the US. Recently, a team of researchers at Cornell has started to address the management of cucumber beetles. The information generated so far and the proposed research and educational efforts constitute a comprehensive effort to develop environmentally benign control tactics for these important pests. The cultural and biological control tactics and the use of attractants, as proposed herein, all replace or minimize the need for pesticide inputs, resulting in a more sustainable farming system. All these tactics are relatively simple to use and, with the help of cooperating farmers and Extension

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### Grant:

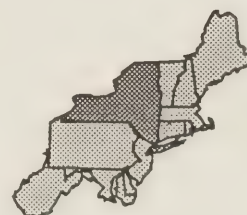
\$135,832 for three years

### Non-federal matching funds:

\$61,296

### Project number:

ANE95.22



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**Project number:**  
ANE95.22

personnel, their practical application will be assured.

The benefits of this research extend across the US, and several of the proposed tactics have applications against other pests. Economic benefits include reduced pesticide

costs and labor associated with spraying and increases in yield and quality. Social benefits include improved relationships between cucurbit producers and non-farm neighbors.

### Presidedress Soil Nitrate Test for Fall Cabbage Vegetable Systems

*This two-year study extends the use of the Presidedress Soil Nitrate Test (PSNT) from corn to other vegetable crops. Researcher and farmer collaborators will evaluate the PSNT for use with fall cabbage and determine how effectively cabbage uses carry over nitrogen from spring crops. Goals include reducing nitrate pollution and enabling more efficient, profitable crop production.*

#### Abstract

Efficient use of nitrogen fertilizer is important to achieve optimum crop yield, farm profitability, avoidance of water pollution, and conservation of natural resources. The Presidedress Soil Nitrate Test (PSNT) is being used to improve nitrogen management in field corn and sweet corn. The PSNT is most useful as a nitrogen sufficiency test for soils that may be expected to have significant amounts of mineral nitrogen. It is difficult to justify widespread use to the PSNT on land used for vegetable production that often has low soil NO<sub>3</sub>-N test levels. Future research and Extension programs using the PSNT should therefore focus on cropping systems where the test will be most beneficial from the perspective of the grower and the environment.

Fall cabbage is planted after harvest of spring vegetable crops such as sweet corn, snap bean, and lettuce. These crops often leave significant amounts of carryover nitrogen in the soil. The PSNT may be useful to improve nitrogen management with fall cabbage (or other cole crops) grown as a "catch crop" to utilize residual N. Our proposed two-year study is designed to evaluate the PSNT for use with fall cabbage and to determine the effectiveness of cabbage for utilization of carryover nitrogen from spring crops. Results will be used to develop Extension materials and education programs. The findings with cabbage should complement current Extension programs on use of the PSNT with sweet corn and field corn. Implementation of the PSNT by vegetable growers on an additional crop is expected to improve

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#### Participants:

Rutgers University  
University of Connecticut  
University of Delaware  
Farmers in New Jersey,  
Connecticut and Delaware

#### Grant:

\$45,000

#### Non-federal matching funds:

\$73,936

#### Project number:

LNE95-56



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**Project number:**  
LNE95-56

nitrogen recommendations, reduce nitrate leaching losses and enable more efficient, economically viable crop production.

#### **Objectives**

1. Evaluate the usefulness of the PSNT to accurately identify nitrogen responsive and non-responsive fields planted with fall cabbage.
2. Measure fall cabbage yield response to fertilizer nitrogen rates following harvest of early season crops such as sweet corn, snap beans, or lettuce.
3. Measure recovery of residual mineral N from soil by fall cabbage.

#### **Approach and Methods**

Cooperating vegetable producers will designate a field and the preceding spring vegetable crop (sweet corn, snap bean, or lettuce) to be used for this project. Cabbage transplants will be set in the field in late July or early August immediately after harvest of the spring vegetable crop. Fertilization and cultural practices for production of the spring vegetable crop will be according to Rutgers Commercial Vegetable Production Recommendations. Soil NO<sub>3</sub>-N and NH<sub>4</sub>-N concentrations in the surface 12 inches will be determined after harvest of the spring crop and just before nitrogen fertilizer is applied to cabbage.

The experiment will be conducted as a randomized complete block design using four replications of five treatments. The nitrogen treatments will consist of 0,40,80,120, and 160 lbs N/A applied as a sidedress. The plots will be hand-harvested to determine yield of marketable and nonmarketable cabbage heads. Total above

ground dry matter and plant nitrogen concentration will be measured to determine the crop nitrogen accumulation. Data will be used to develop cabbage yield response curves to nitrogen application rates at various soil NO<sub>3</sub>-N concentrations and to evaluate crop removal of carryover and applied nitrogen.

#### **Education /Outreach**

Some vegetable producers are already using the PSNT on sweet corn with good results. It is, however, difficult to justify widespread use of the PSNT on land used for vegetable production that may be expected to have low soil NO<sub>3</sub>-N test levels. We propose to target the research results from objectives 1-3, and existing information about use of the PSNT on sweet corn, to specific cropping systems such as fall cabbage where the PSNT will likely be of greatest benefit to vegetable producers.

Results of PSNT evaluation on fall cabbage will be made available to vegetable producers through field day tours, state and county meetings, Extension publications and newsletters. Demonstration plots and field days are planned for state agricultural experiment stations and on cooperator farms.

Educational programs on use of the PSNT will be presented at local and regional meetings such as the New Jersey Vegetable Growers Association Conference and the New England Small Fruit and Vegetable Growers Conference. The results will be published in newsletters such as the New Jersey Vegetable Grower and The Grower-New England Small Fruit and Vegetable Newsletter.

# Implementation of a Disease Forecasting System for Tomatoes in Northern N.J.

## Vegetable Systems

*Grower and university participants will evaluate tomato disease forecasting systems at the Snyder Research and Extension Farm. The project aims to help growers reduce production costs and protect the environment by reducing fungicide applications.*

### Abstract

Three tomato disease forecasting systems — FAST, CUFAST and TOM-CAST — have been developed and used in certain locales for scheduling fungicide applications to control *Alternaria solani* on tomatoes, allowing fungicides to be applied “as needed” and making it possible to reduce fungicide applications while maintaining crop quality.

Cowgill, Maletta and Johnston have evaluated these forecast systems since 1989 and have demonstrated the potential to control early blight with reduced numbers of applications under northern New Jersey climatic conditions. Resulting estimated annual cost savings per acre (labor, equipment, Bravo 720 at 3 pts/acre), averaged over the years that each forecast system has been evaluated, are: FAST — \$210; CUFAST— \$252; TOM-CAST — \$462. Extrapolating to 800 acres of fresh market tomatoes produced in North Jersey, the potential cost savings for three years based on the average number of sprays eliminated with TOM-CAST would have approached \$1.1 million. Reduction in pesticide inputs would have approached 60,000 lbs for a three year period. With the more conservative CUFAST, cost saving would have approached \$ 0.8 million.

The TOM-CAST system appears to have some important advantages over the other forecast systems. In order to implement this system in a program for tomato growers, specific thresholds based on our climate and our weather monitoring equipment must be identified in field trials. The possible disadvantages of TOM-CAST, suggested by our 1993 and 1994 research results, must be investigated. The conservative and consistent results with CUFAST must not be dismissed.

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Phone: 908-788-1339

### Grant:

\$24,230

### Match:

\$40,600

### Project number:

LNE95-59



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**Project number:**  
LNE95-59

Implementing a forecasting system also means developing a cost-effective delivery system and increasing growers' awareness of the benefits of this approach to disease control. Since regional forecasts may be the key to a cost-effective system, expanded numbers of grower demonstration trials are as essential to delineating forecast regions as to demonstrating the value of disease forecasting to growers. Reliability, accuracy and utility of the weather data collection and forecast generation components of the system are critical to disease forecast delivery. Equipment evaluation, procedure standardization, and software development and acquisition are needed.

**Objectives**

- 1) Continue evaluations of tomato disease forecasting systems at the Snyder Research and Extension Farm. Field research is required to: specify thresholds for the TOM-CAST system based on conditions in northern New Jersey and on the weather monitoring instruments being used at grower sites; continue comparison of TOM-CAST to CUFAST and FAST; evaluate fungicide rate and control of post-harvest anthracnose in conjunction with use of forecast systems; and expand the multi-year data base on which the economic impact of disease forecasting will be defined.
- 2) Continue to refine the software required for weather data collection and forecast generation, evaluate weather monitoring equipment, and standardize equipment use procedures.
- 3) Expand the grower demonstration component of the project, increasing the numbers of on-farm weather stations in an extended geographical range.
- 4) Explore means for delivery of disease forecasts through fax-on-demand; through a tomato integrated pest management program and through a crop advisory program.

# Demonstration of Gray Mold Control in Commercial Tomato Greenhouse Systems Using a Registered Biological Pesticide

## Vegetable Systems

*In an effort to reduce chemical pesticide use in tomato-producing greenhouses and reduce fungicide-resistant isolates of the fungus, this project will demonstrate the use of a registered biological pesticide for control of gray mold. Results will be extended to vegetable and ornamental greenhouse crop producers.*

### Abstract

One of the most difficult diseases to control on greenhouse tomatoes is gray mold, caused by the fungus *Botrytis cinerea*. The fungus is cosmopolitan and has a wide host range consisting of field and greenhouse vegetable, fruit and ornamental crops. Traditional methods for control of *B. cinerea* on greenhouse tomatoes have integrated chemical fungicide sprays and cultural practices that result in an environment unfavorable for infection and disease development. However, *B. cinerea* is a fungus characterized by rapid growth over a wide range of temperature, moisture and light regimes, expeditious and abundant asexual reproduction, and development of fungicide resistance.

In various greenhouse and field grown crops, *B. cinerea* has developed resistance to benomyl, captan, chloronitrobenzenes, copper, icarboximides, dichlofluanid, dicloran, ethylenebisdithiocarbamates, iprodione, procymidone, thiophanate-methyl, and vinclozolin. In New York, fungicide resistance to benomyl, thiophanate-methyl, and vinclozolin has been documented in *B. cinerea* isolates from snap beans. Resistance in greenhouse isolates has not been studied. Chlorothalonil and dicloran are currently the only registered chemical fungicides for use in commercial greenhouses to control *B. cinerea* on tomatoes. Resistance in *B. cinerea* to chlorothalonil has not been reported, but the intense selection pressure in greenhouse tomato production could result in decreased isolate sensitivity. Dicloran has only recently (May 1, 1995) been registered on greenhouse tomatoes in New York, thus there has not been previous selection pressure for resistance.

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Phone: 315-787-2376

### Participants:

Cornell University  
AgBio Development, Inc.  
Crop Advangate  
J.E. Davie Farms

### ACE Grant:

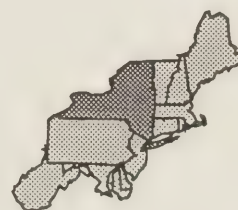
\$31,601

### Match:

17,693

### Project number:

ANE95.29



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**Project number:**  
ANE95.29

**Objectives**

- 1) demonstrate efficacy of a registered biological pesticide (Mycostop) for control of gray mold, caused by *B. cinerea*, in commercial greenhouse production of tomatoes;
- 2) monitor the fungicide sensitivity (to thiophanate-methyl, vinclozolin, dicloran, and chlorothalonil) of isolates of *B. cinerea* prior to and after treatment with a biological pesticide in a commercial greenhouse; and
- 3) provide significant outreach to other greenhouse producers of tomato and ornamental crops on the economic and biological benefits associated with integrating a biological pesticide and cultural practices.

The biological pesticide, Mycostop, is registered for use on greenhouse tomatoes for control of *B. cinerea* (EPA Registration No. 64137-2). The product consists of dried spores and mycelium of *Streptomyces griseoviridis* Strain K61. As formulated, there are 108 cfu (colony forming units) per

1 gram of product. The material can be applied as a soil drench, soil spray, or foliar spray. The hyperparasite *S. griseoviridis* achieves control by secreting cell-wall-dissolving enzymes and subsequently rowing inside the hyphae of *B. cinerea* causing their lysis and destruction. Thus, the biological pesticide Mycostop has curative activity. Because of this feature, Mycostop can be used as a directed spray to susceptible and/or infected tissues on an as-needed basis (prescriptive pesticide use).

The mode of action of this biological pesticide makes it unlikely to select for resistance in *B. cinerea*. The *B. cinerea* isolates at the test site will be monitored to quantify changes in fungicide sensitivity. The potential outcomes of this project will be to reduce chemical pesticide use in tomato producing greenhouses in New York, demonstrate a reduction in fungicide-resistant isolates of *B. cinerea*, and extend the results to appropriate vegetable and ornamental greenhouse crop producers.

# Integrating Microbial Insecticides and Oils into Sweet Corn IPM in Massachusetts

## Vegetable Systems

*This integrated research and extension project will evaluate alternative, low-risk insect management strategies in fresh market sweet corn. Participants will evaluate Bts to control three common caterpillar pests that can threaten ear quality and marketability.*

### Abstract

This integrated research and extension project will evaluate alternative, low-risk insect management strategies in fresh market sweet corn. Sweet corn is a high-acreage, heavily-sprayed crop that plays a key role in the vegetable industry in Massachusetts and throughout the Northeast. Three caterpillar pests threaten ear quality and must be controlled in order to produce marketable corn. Currently there are no proven alternatives to the widely-used, broad-spectrum insecticides which have high mammalian toxicity, such as methomyl, permethrin, esfenvalerate and thiodicarb. Even under Integrated Pest Management guidelines, growers make an average of 3.5 insecticide applications to sweet corn crops. These applications pose risks to applicators, farmworkers, neighbors and consumers of sweet corn, to soil and water, and as well to beneficial insects.

The proposed alternative methods use *Bacillus thuringiensis* to control the key pests of corn. For control of European corn borer and fall armyworm, foliar applications of commercial B.t. products will be evaluated. For control of corn earworm, a strategy using direct silk applications of vegetable or mineral oil mixed with B.t. using a semi-mechanized hand applicator will be developed. Both of these projects build upon several years of research at the University of Massachusetts which show that commercially acceptable levels of control can be achieved using these methods.

The project will use replicated field experiments to evaluate specific aspects of each strategy such as timing, application rates, impact on natural enemies, and appropriate modifications of current IPM guidelines. We will also involve farmers in evaluating both strategies in on-farm, field-scale trials. The New England Vegetable and Berry Growers Association and New England Organic Farming Association, the two major commodity

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Phone: 413-545-3696

### Participants:

University of Massachusetts  
Hampshire College  
Vegetable growers  
New England Vegetable and  
Berry Growers Association  
NOFA-Massachusetts

### ACE Grant:

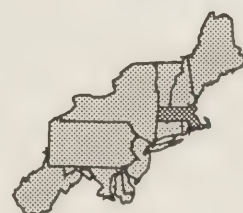
\$30,138

### Non-federal match:

\$10,598

### Project number:

ANE95.26



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**Project number:**  
ANE95.26

organizations serving vegetable growers in New England, both endorse the project and will support it by identifying likely grower candidates to participate in trials and by publicizing the results. A collaborative research project with Hampshire College and the Lemelson National Program in Invention, Innovation and Creativity is providing funds for the development of the oil applicator for corn earworm control. Two farmers are committing acreage in late-season corn in 1995 for evaluation of oil applications for earworm.

These alternative methods will be integrated into the current IPM program for sweet corn, which is widely adopted throughout Massachusetts. Project impact will be measured through direct observation of changes in populations of beneficial insects, by applying published models of

environmental impact to alternative versus conventional systems, and by documenting changes in farmer practices.

#### **Objectives**

1. Evaluate the effectiveness of commercial *Bacillus thuringiensis* products against European corn borer and fall armyworm in fresh market sweet corn in Massachusetts.
2. Develop an alternative control for corn earworm using direct silk treatments with oil and *Bacillus thuringiensis*.
3. Integrate alternative insect controls into existing Integrated Pest Management systems used by sweet corn growers in the Northeast.

# Utilization of a Neem Product in a Reduced Synthetic Insecticide Management Program for Colorado Potato Beetle

Vegetable Systems

*Motivated by grower interest in alternative controls for Colorado potato beetles and grower skepticism about the effectiveness and affordability of such methods, this project will test the effectiveness of several management regimes involving neem products and *Bacillus thuringiensis* (Bt). The strategies are geared to take advantage of neem's effectiveness in reducing beetle egg-laying and boosting the effectiveness of other insecticides.*

## Abstract

Many potato growers have relied heavily on the use of synthetic chemical insecticides for the control of insect pests. Unfortunately, the most important pest, the Colorado potato beetle, has developed genetic resistance to most classes of insecticides registered for its control resulting in control failures, crop losses and more frequent use of increasingly toxic compounds at higher rates than ever before. We growers would like to take advantage of new materials and methods that are not only more effective, but also less hazardous to the environment and to human health. However, most of us are not convinced that the available environmentally safe alternatives, such as two newly registered neem products (a plant extract) and the microbial insecticide, *Bacillus thuringiensis* (Bt), can be effectively and affordably used for Colorado potato beetle management.

Research conducted at the University of Maine indicates that neem products and Bt can be used in an unconventional approach which yields greater pest control at lower application rates than when used as marketed in a conventional larvicidal approach. We are proposing to demonstrate the effectiveness of several different Colorado potato beetle management regimes that take advantage of neem's effectiveness in reducing beetle egg-laying and boosting the effectiveness of other insecticides, thus enabling the effective use of reduced amounts of conventional and biological insecticides.

## Coordinators:

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University of Maine  
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Phone: 207-581-2961

## Participants:

University of Maine  
Maine potato farmers

## Grant:

\$18,245

## Non-federal matching funds:

\$13,291

## Project number:

ANE95.27



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**Project number:**  
ANE95.27

The results of this on-farm demonstration will be made available to other potato producers throughout the region. This project is expected to result directly in the adoption of reduced synthetic chemical insecticide-based pest management practices.

**Objectives:**

- 1) Demonstrate the effectiveness of a neem product used to reduce crop damage

caused by the Colorado potato beetle through interference with egg-laying on a commercial potato farm.

- 2) Demonstrate the costs and effectiveness of a neem product used in combination or in rotation with conventional chemical insecticides or Bt in a reduced insecticide management program for Colorado potato beetle on a commercial potato farm.

# A Living Lab/Classroom for the Integration of Research & Education Efforts on Alternative Vegetable Production Systems

## Vegetable Systems

*The third year of a multi-disciplinary evaluation of the agricultural, ecological and economic performance of five vegetable production systems, ranging from a certified organic operation to conventional agrichemical and tillage system.*

### Abstract

There are a number of obstacles to efficient the development of more sustainable vegetable production practices. First, is the lack of scientific information on the relative ecological, agricultural and economic performance of current vegetable management systems, which hinders implementation of practically tested approaches. Secondly, is the lack of research data on the complex interactions occurring within vegetable crop ecosystems, which hinders the development of innovative and more sustainable approaches. Thirdly, is the lack of understanding among the general public of either agricultural production or the research process, which creates an atmosphere of uncertainty that adversely effects the soundness of legislative policy. There is an urgent need to address these problems in a timely fashion. Environmental groups are primarily concerned about irreparable damage to our natural resource base, while agricultural groups are primarily concerned with protecting their livelihood in the face of restrictive legislation. This project proposes to expand research on an integrated research/teaching platform or 'living laboratory/classroom' for the evaluation and development of innovative vegetable production strategies. This platform, which currently represents a two-year multidisciplinary and grower research effort, consists of four adjacent fields in a four year rotation of vegetable crops. Three soil management approaches and three pest management approaches are combined to create five different management systems which range from 'certified organic' to conventional agrichemical and tillage approaches. In addition, four plots per replication are available for single component variations of the five main approaches. Baseline data are continually monitored on economics of all inputs, weather, plant growth

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### SARE Grant:

\$76,521

### Matching non-federal funds:

\$10,587

### Project number:

LNE92-32



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**Project number:**

LNE92-32

and development, soil properties and nutrients, arthropods, pathogens, plant tissue nutrients, yield and quality, human nutritional quality, consumer acceptance, post-harvest storability, and projected economic returns. Priority research areas have been identified, and investigators will use these baseline data, and studies imbedded into the platform and on grower's fields, to improve water use efficiency,

nutrient cycling, nonchemical weed control, environmentally benign disease control, arthropod ecology and management, and production economics of alternative vegetable production systems. Repeated, structured in-field educational programs are designed as part of the research/teaching platform, as well as newsletters, and Extension programming to ensure an evolution of alternative vegetable production systems.

# Development of Fungal Entomopathogens for Greenhouse IPM

## Ornamentals

*University researchers, extension specialists and growers will collaborate to evaluate the compatibility of insect-killing fungi with other components of a biorational IPM strategy for western flower thrips and silver leaf whitefly, two of the most important pests in commercial floriculture. Investigators will determine compatibility with two non-target beneficial insects and several commonly used biorational pesticide, develop guidelines for the use of fungi within IPM, and establish demonstration and training programs.*

### Abstract

Our research goal is to evaluate the compatibility of formulated and non formulated indigenous entomopathogenic fungi with other components of a biorational IPM strategy for western flower thrips and silver leaf whitefly, the two most important pests in commercial floriculture. We will determine fungal compatibility with two important non-target beneficial and several commonly used biorational pesticides. This information will be consolidated to develop guidelines for use of fungi within IPM and for a demonstration trial in a research greenhouse. An IPM Advisory Committee including Northeast growers will be established to consult on practical aspects related to incorporation of insect-killing fungi into IPM and implementation of IPM programs in the Tri-State region. A demonstration/training scouting program will be started in local greenhouses and used to illustrate the cost/benefit ratio of scouting, and define its use for making management decisions relevant to the application of fungi and the more judicious use of pesticides. Training workshops will be held in the Tri-State region to promote a wider adoption of IPM.

This project will contribute to the goals of the SARE and ACE programs by:

- developing alternative pest management products to replace chemical insecticides in floriculture;
- targeting the two most serious greenhouse insect pests in the US;

### Project Coordinators:

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Phone: 802-658-4453

### Participants:

University of Vermont &  
Vermont Extension System  
Cornell University  
New York IPM Program  
University of Massachusetts &  
Mass. Extension System  
University of New Hampshire  
& N.H. Extension System  
University of Maine & Maine  
Extension System  
Vt. Association of Professional  
Horticulturalists

### SARE/ACE Grants:

\$231,931 for three years

### Non-federal matching funds:

\$155,808

### Project numbers:

LNE95-58 &  
ANE95.23



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**Project numbers:**

LNE95-58 &  
ANE95.23

- promoting management practices that support growers prudent use of pesticides;
- establishing a forum for direct communication between growers and researchers which enhances the development and adoption of IPM;
- evaluating the suitability and compatibility of fungal pathogens for insect pest control as an integral part of greenhouse IPM;
- uniting the interests and expertise of researchers, growers, biotechnology companies and federal and state agencies toward the common goal of developing fungal entomopathogens for greenhouse IPM; and
- generating information with potential applications for other ornamental and vegetable crops.

# Integration of Biological and Chemical Control of Twospotted Spider Mites in Containerized Nursery Production

## Ornamentals

*This project targets a key pest, twospotted spider mites, as the first step in introducing advanced IPM to nurseries. Participants will determine economic thresholds for the pest and develop and test a control system that involves predatory mites and selective dosages of miticides.*

## Abstract

Nursery products are intensively treated with pesticides to preserve aesthetic value, often on a preventative rather than on an as-needed basis. This project proposes to target a key pest —the twospotted spider mite, *Tetranychus urticae* Koch — as a first step to introducing advanced integrated pest management practices to nurseries. Advance in the integration of biological and chemical control of this pest in nurseries is founded on experiences from strawberry and orchard systems. Use of the minimum quantity of fungal-derived selective miticides in nurseries will reduce the risk of ground- and surface-water pollution, non-target wildlife and worker exposure to pesticides, and reduce selection for pesticide resistance.

The twospotted spider mite requires as many as ten pesticide applications per year in nurseries; even then, nurseries throughout the U.S. sustain considerable economic damage. This project proposes to research and implement an integrated mite management program in *Euonymus alata* Compacta (EAC), an especially mite-sensitive crop. Commercially available or native predatory mites will be inoculatively released in the crop, and a favorable balance between predator and prey maintained with selective miticide applications (if needed). Research specific to implementing this program will be: (1) to determine efficient sampling methods for twospotted spider mite in EAC, (2) economic thresholds for twospotted spider mites, (3) effective predators to use in the EAC system, and (4) selective dosages of miticides.

High acceptance by nursery growers of the results from this proposal is expected due to increased profitability resulting from (1) reduced use of insecticides and miticides, (2) reduced labor

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Phone: 203-345-4511

### Participants:

Connecticut Agricultural  
Experiment Station  
University of Connecticut  
Imperial Nurseries

### ACE Grant:

\$35,246

**Match:**

\$18,836

## Project number:

ANE95.28



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**Project number:**  
ANE95.28

for crop production, (3) higher plant quality due to maintenance of mite populations below damaging levels, and (4) improved plant growth due to reduced phytotoxicity.

**Objectives**

1. To determine which of three microbially derived miticides provides the most selective mortality of twospotted spider mites relative to candidate phytoseiid predators.
2. To determine which species of phytoseiid mite predators can be used in a nursery.
3. To determine the most effective sampling

method for mites in a nursery.

4. To determine the action threshold for mite populations that should trigger application of a selective miticide.
5. To determine whether a reduced-pesticide production system will release other pests from pesticidal suppression.
6. To substantially reduce the dosage equivalents of miticides applied in a nursery.
7. To extend the research and management results from a bellweather nursery to other nurseries.

# Commercial Small-Scale Food Processing in New York: Value-Adding for Sustainable Agriculture

## Marketing and Adding Value

*Aimed at enhancing farm income, rural employment and quality of life, this two-year project will track small-scale food processors (both on-farm and non-farm based); organize a statewide conference on small-scale food processing with emphasis on technical and public policy issues; develop policy recommendations; and possibly facilitate a statewide or regional association.*

### Abstract

This project will demonstrate the contributions small-scale food processors make toward sustainable agriculture and rural community development. The farmers share of the consumer food dollar has declined from 46 percent in 1913 to 26 percent in 1992 (US Department of Commerce, 1975; USDA, 1993). Similarly, the number of farms in New York has declined by one thousand each year for the last ten years. We think, based on ongoing research, that these two trends are linked because decreasing the value of products at the farm level decreases the economic sustainability of farms.

Farmstead food processing, we argue, produces opportunities for farm households to capture larger shares of consumer food dollars than they could by selling undifferentiated agricultural commodities. Likewise, non-farm-based, but locally owned and operated small-scale food processing enterprises are also valuable to rural areas since they create new markets for higher value farm products. In both instances, jobs can be created and new income generated in and for rural areas. Increased income and jobs can contribute to improved quality of life for farm families and rural communities. For these reasons, we believe that small-scale food processing is an important part of a sustainable agriculture strategy. We do need, however, to develop a more thorough understanding of the characteristics of the small-scale food processing industry.

Data on commercial food manufacturing suggests that small-scale food processors are increasing in New York State and throughout the Northeast. These microenterprises engage in a

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### Participants:

Cornell University  
NY Sustainable Agriculture  
Working Group  
New York Department of  
Agriculture and Markets  
New York farmers and food  
processors

### SARE Grant:

\$63,881

### Non-federal matching funds:

\$15,734

### Project number:

LNE95-60



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**Project number:**

LNE95-60

wide range of value-adding activities, including processing raw agricultural commodities, such as milk, meat, and grains, and preparing high-value specialty items such as condiments, sauces, confections, and fruit preparations. The actual extent and number of small-scale food processing activity is probably substantially greater than published data suggests because the Census of Manufacturers does not include many farm or home-based businesses. We do not know what is motivating small-scale, value-added production. We do not know what the barriers are (including technical, political, regulatory, etc.) that are challenging these entrepreneurs. Finally, it is not clear what can be done to promote small-scale food processors as part of a comprehensive sustainable agriculture and rural development strategy. This two-year project, involving Cornell University, the New York Sustainable Agriculture Working Group, and the New York State Department of Agriculture and Markets, includes two phases. The first is for data collection and incorporates a mail survey of a sample of small-scale food processors in New York, and case studies of four enterprises. The findings in this first phase will be used in the education and public policy phase that will include: a statewide conference on small-scale food processing with emphasis on technical and public policy issues; the development of public policy recommendations; and the possible facilitation of a statewide or Northeast regional small-scale food processing association. The project will proceed as follows:

1. Establish a database to track farmers and other entrepreneurs starting and operating small-scale food processing businesses in

- NY. 2. Develop a classification (typology) of small-scale food processing businesses according to farm-based vs. non-farm-based, different information and assistance needs, income or sales classes, and types of products. 3. Identify the keys to success in small-scale food processing and discern the technical, regulatory, and other barriers. 4. Develop a series of case studies of processors, illustrating how and why they got into business, their successes and failures, their business goals and the barriers they are experiencing. 5. Assess the need for and the interest in a trade association in New York or the Northeast specifically for small-scale processors. Such an organization could provide an issues forum, a newsletter, a products directory, educational programs, as well as represent members interests to government. 6. Develop strategies that communities can use to promote local development through small-scale food processing.

**Objectives:**

1. Organize a state-wide conference for small-scale food processors to meet with food scientists, policy makers, and regulators to discuss issues and concerns and to share information with each other.
2. Develop policy and regulatory recommendations for both state and local agencies (e.g., County Departments of Health, New York State Dept. of Agriculture and Markets, USDA, and the Department of Environmental Conservation).
3. Facilitate the establishment of either a statewide or a Northeast regional small-scale food processors trade association (if research shows this is justified).

# A Survey of Community Supported Agriculture Consumers

## Marketing and Adding Value

*This project will describe members of three Community Supported Agriculture (CSA) farms in Vermont, determine the factors that influence consumers' decisions to join a CSA and their satisfaction with products they receive.*

### Abstract

This project will describe members and nonmembers of three Community Supported Agriculture (CSA) farms in Vermont, determine factors that influence consumers' decisions to join a CSA, determine consumers' satisfaction with products received from CSAs, and present the above information to farmers and policy makers in an easily understood form. Direct-marketing of agricultural products has numerous benefits for both farmers and consumers, and the CSA model has the potential to reduce producer risk while providing consumers greater access to their food production system. Data will be gathered via surveys administered through the Computer Assisted Telephone Interview system during one week in September of 1995. A logistic regression model will be run in which the limited dependent variable will be consumers' decision whether to join a CSA and socioeconomic and attitudinal data constitute the independent variables. The strength and significance of variables that affect membership will be determined. Once the results have been synthesized into an easily understood form, they will be submitted to relevant journals and newsletters, and they will be presented at workshops arranged with the help of University of Vermont Extension faculty. A copy of the results will also be submitted to the State Department of Agriculture and Markets.

### Coordinator:

Jane Kolodinsky  
Department of Community  
Development and Applied  
Economics  
University of Vermont  
Burlington, VT 05405

### SARE grant:

\$2,960

### Non-federal matching funds:

\$4,160

### Project number:

LNE95-53





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**Abstract**

**Participants:** University of Massachusetts,

Northeast region. Proposed research will analyze the economic viability of CSA. Educational programs will focus on enhancing farmers

**SARE Grant:** \$150,000

of CSA as an alternative agricultural production and marketing strategy. Survey data will be collected from a sample of CSA

operations for each of the three project years. These data will provide information needed to quantify GSA's economic liability.

in the Northeast. Analysis will focus on CSA costs, returns, and  
 Project Number: LNE05-63

oped from the research will play an important role in outreach to

makers about this form of agriculture.

problem solving will be accomplished in two ways. A CSA Farm

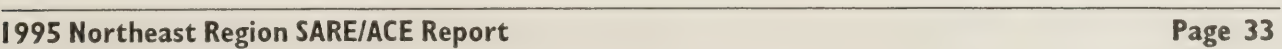
network will be published that will reach all CSA and specialty farms in the Northeast. The publication will use resources from

seven state NOFA organizations, MOGRA and the Bio-Dynamics Association to identify and list all CSA and specialty farms in the

Northeast region. The publication will increase farm linkages between CSA and specialty farms. Increased linkages between

CSA and specialty farms can improve the financial viability of these farms. Peer education and mentoring is an educational

component consisting of regional educational meetings for

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**Project Number:**  
LNE95-63

farmers, core group members and sharers; on-site mentoring at farms; phone consultation; peer networking; and a peer education conference. The ability of each part of the

project to reach the CSA clientele will be improved through cooperation of project participants.

## Managing Dairy Waste Using Constructed Wetlands and Composting

## Livestock Systems

*Participants will test the use of constructed wetlands and composting as reduced-cost treatment options for dairy parlor effluent and solid wastes.*

## Abstract

Dairy waste generation and disposal have become issues of concern in the northeastern U.S. due to trends in increased operation size, intensity of land use, and encroachment of urban/suburban development. The practice of more cows on less land has resulted in excessive land application of manure and solid wastes as well as oversaturation of lagoons and holding ponds used to treat parlor effluent. Such scenarios ultimately contribute to non-point source pollution of surface and ground water supplies.

Waste management strategies like constructed wetlands and composting have the potential to offer low-cost waste treatment solutions for dairy farmers in the Northeast Region. Nonetheless, many dairy farmers have little experience with these practices and often cannot afford to risk investment in technologies that may need refinement for treating nutrient-laden animal wastes. The proposed project is an attempt to deal with both solid and liquid waste from a dairy farm by combining constructed wetlands and composting. This holistic waste management system will serve as a demonstration for farmers, extension personnel and nutrient managers. It will also link rural and urban communities through outreach and educational programs designed to showcase innovative solutions to farm waste problems.

A six cell wetland to treat dairy parlor effluent and compost piles to stabilize dairy solid wastes are being established on a demonstration dairy farm in central Maryland. One specific goal of the constructed wetlands is to test the feasibility of upstream filters to oxygenate dairy parlor effluent. The composting activities will compare different feedstocks including on-farm crop residues, urban wastes and barn bedding for co-composting with the dairy solids using windrow composting. We will monitor the ecological, agronomic and economic aspects of both wetlands and compost activities over a two-year period. We also plan to sponsor workshops, field days and mini-courses to inform both

**Coordinator:**

Julie Cronk  
University of Maryland  
Department of Ag.  
Engineering  
College Park, MD 20742-5711

Phone: 301-405-1196

## SARE grant

\$110,305 for two years

### Non-federal matching funds:

\$119,250

**Project number:**

LNE95-62



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**Project number:**  
LNE95-62

rural and urban communities about the feasibility of adopting these waste management practices.

If these innovative best management practices prove successful, they will be of great importance to dairy farmers and to the state agencies responsible for nutrient reductions in the Chesapeake Bay. It is vital to test these low-cost BMPs in order to discover the most effective strategies for dealing with the growing problem of agricultural waste.

**Objectives**

1. To educate farmers and others about low-cost options for the management of dairy waste.
  - a. To promote more sustainable options for dairy waste disposal for farmers and provide opportunities for supplemental income generation.
  - b. To train statewide (MD) certified nutrient managers and extension personnel in the use of constructed wetlands and composting.
  - c. To expose both rural and surrounding urban communities to alternative environ-

mentally friendly waste management systems.

2. To determine the effectiveness of constructed wetlands in treating dairy parlor effluent.
  - a. To evaluate the use of waste pretreatment structures in improving the efficacy of constructed wetlands.
  - b. To assess effects of seasonality on the wetlands' ability to treat waste.
3. To demonstrate the feasibility of using composting to deal with solid dairy waste.
  - a. To test several low-tech composting methods for stabilizing solid waste from dairy barns and parlor.
  - b. To evaluate potential feedstocks for co-composting of dairy waste.
4. To assess the economic feasibility of establishing alternative waste management practices on dairy farms.
  - a. To evaluate the possible profit from marketing composted materials.
  - b. To evaluate compost quality.

# Expanding Profits for Sheep Production through Intensive Pasture Management

## Livestock Systems

*Vermont researchers and sheep producers will collaborate in an investigation of the viability of a pasture-based sheep production system that is compatible with preservation of the region's natural resource base. Participants will study ways to increase profitability for producers through lower cost production methods, alternative marketing and cooperative learning.*

### Abstract

The agricultural landscape of Vermont is changing. Dairy farmers are finding it increasingly difficult to make a profit due to declining or stagnant milk prices and high production costs. And although dairying will likely remain as Vermont's primary agricultural enterprise, many current and potential producers are searching for alternative sources of income.

From 1820 to 1865, sheep production was a major economic activity in the state. The rolling hills of Vermont are still ideal for raising sheep, and many see this as a natural alternative to dairying. However, those who are currently engaged in sheep production have had a difficult time making a profit, even though there is a viable market for lamb in nearby urban areas. The growing awareness in Vermont, as across the country, of the advantages of pasture-based livestock production has prompted many sheep breeders to begin experimenting with that production method as they search for financial viability. But, because pasture-based sheep production is practiced by so few in the eastern US, it has been difficult to spread the practice and fully develop it in the Northeast. To address this issue, Vermont researchers and sheep producers have agreed to collaborate on an investigation of the financial viability of pasture-based sheep production using a cooperative learning and outreach model. This will be primarily an education and demonstration project.

### Goals and Objectives

The goal of the project is to increase profitability for producers through lower cost production methods, alternative marketing,

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### Participants:

University of Vermont  
Vermont Sheep Breeders  
Association  
Vermont Department of  
Agriculture  
Sheep farmers

### SARE grant:

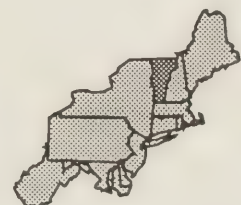
\$82,427

### Matching funds:

\$84,390

### Project number:

LNE95-54



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**Project number:**  
LNE95-54.

and cooperative learning.

To accomplish this, the research team will work with a specific number of producers to assist them in adopting an efficient record-keeping system and test and demonstrate more effective pasture utilization methods in order to realize increased profit from improved decision making and improved resource use. Production methods and financial data will be collected and analyzed to address the following questions:

- Can producers make a profit by more effectively utilizing the pasture resource?
- What management and/or planning tools are effective for meeting economic and lifestyle goals of sheep producers?
- Does a cooperatively managed research and outreach program produce more readily usable information for agricultural producers?

The model farms will then be used as demonstrations for a wider audience of

producers. Farm walks, discussion groups and workshops will be organized to disseminate the information to sheep producers throughout the state. The marketing component of this project will create opportunities for producers to sell their grass-fed lambs to current or new outlets developed throughout the course of the project.

Specific objectives are to:

- 1) investigate the economic feasibility and production capacity of finishing lambs on pasture;
- 2) test the applicability of management systems, specifically the Standardized Performance Analysis (SPA) and Holistic Resource Management (HRM);
- 3) identify, evaluate, and develop potential alternative lamb markets as an addition to, or a supplement for, commercial lamb sales; and
- 4) implement a model for cooperative research and information dissemination.

### Fescue Endophyte Research Study

### Livestock Systems

*In an effort to improve grazing systems and sustain grassland farming operations, participants will test pastures for levels of endophyte in tall fescue and recommend proper grazing methods. Farmers in the Appalachian region have planted fescue for years because of its hardiness. But high levels of a parasitic fescue endophyte can cause serious production losses. The project's goal is to improve the viability of small farm operators and to increase the overall health of the region's livestock population through testing and recommendations.*

#### Abstract

A joint effort is planned by the Allegany Soil Conservation District, and other parties to test pastures for levels of endophyte in tall fescue. High levels can cause serious loss of production in livestock. Local testing will speed up test results and reduce costs for participants.

Farmers have been planting tall fescue for years. Preliminary studies have shown toxin levels to be near the 100 percent range. There exists no close facilities that test the plant tissue at a reasonable cost. Furthermore, shipping the specimens in a refrigerated condition and in a timely manner increases cost and places the material at risk.

By obtaining the equipment needed for endophyte testing research, lab results will be more economical and practical to area farmers. Since the fescue fungus directly impedes herd health, livestock body temperatures will be recorded, as well as other animal behavior traits. Testing will be performed by as few people as possible to maintain consistency. The pasture fields of the tri-state area are our testing sites.

Our findings will help assist our suggested recommendations. The materials used are mobile and will be used in field days, workshops, and demonstrations. Test results will be used to

#### Coordinator:

Craig Hartsock  
Allegany Soil Conservation  
District  
11602 Bedford Road, NE  
Cumberland MD, 21502

Phone: 301-777-1494

#### SARE grant:

\$9,632

#### Non-federal match:

\$7,310

#### Other federal contributions:

\$5,696

#### Project number:

LNE95-52



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**Project number:**  
LNE95-52

improve grazing systems and sustain grassland farming operations. After the grant is concluded, the material will be used to continue forage analysis of fescue toxicity.

**Objectives**

The overall goal of the Fescue Endophyte Research Study is to improve the viability of small farm operators and to increase the overall health of the regions livestock population through testing of tall fescue pastures and recommending proper grazing methods. To accomplish this goal, the project will take the following steps

1. 50% of all farms with fescue pastures in Allegany County will have pasture fields tested for fescue endophytes by Novem-

ber 1, 1997.

2. 60% of herds found to be grazing infected fescue will be tested to determine herd health by the end of the project.
3. By January 1, 1998, begin using the results of the Fescue Endophyte Research Study as a basis for making sustainable management ecommendations to the agricultural community.
- 4: By January 1, 1998, conduct an agricultural demonstration field day to share with the farming community the Fescue Endophyte Research Study results.
5. By January 1, 1998, conduct a workshop for conservation groups, government agencies, and sportsmen organizations, to share results of the study and its correlation to wildlife habitat.

# Control of Gastrointestinal Nematodes in Dairy Cattle under Intensive Rotation Grazing Management

## Livestock Systems

*Initiated to help a Pennsylvania farm where parasites appear to have affected milk production, this project will develop and test a strategic worming regimen to control the problem. Investigators will also investigate the frequency of similar problems at other Northeast farms using rotational grazing techniques.*

### Abstract

1. Efforts to increase both the sustainability and profitability of American agriculture have led to the better utilization of grass-land resources. A major component of this enhanced usage of available forages is the development and implementation of intensive grazing systems. Such intensive systems more fully utilize available nutritional resources and minimize the use of supplemental feeds and feed crops. Although the agronomic, nutritional and economic aspects of intensive grazing systems in the US are currently being documented, the transmission potential and harmful effects of ruminant gastrointestinal (GI) nematode parasites in such systems have received scant attention. These nematodes are direct transmission parasites that are acquired from forage as the host grazes. Over time, these parasites have evolved sophisticated and complex behavioral traits that take advantage of host grazing conduct to insure transmission to the host. Currently, the most efficient way to control these parasites is to administer broad spectrum anthelmintic drugs on a treatment protocol that minimizes parasite transmission. Because it is not feasible to try to eradicate the parasites, the aim of such "strategic" treatment is to identify periods of transmission that are optimal for anthelmintic intervention, and to use the drugs in such a way that parasite build-up on pasture does not occur. Such strategic treatment has been well documented in conventional grazing programs, but has not been well defined under intensive rotational grazing patterns. This is especially worrisome because certain aspects of rotational grazing programs appear to favor nematode transmission (eg. forced grazing nearer to fecal pats).

### Goals and Objectives:

### Coordinator:

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USDA-Agricultural Research  
Service  
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BARC-East  
10300 Baltimore Ave.  
Beltsville, MD 20705-2350

Phone: 301-504-8509

### Participants:

USDA-ARS  
Pennsylvania State University  
Louisiana State University  
USDA-NRCS  
Farmers

### SARE grant:

\$45,000

### Other federal funds:

\$46,500

### Project number:

LNE95-55



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**Project number:**  
LNE95-55

- Determine the dynamics of gastrointestinal nematode transmission in dairy cattle on a farm which has been forced to increase the frequency of anthelmintic treatment since adopting an intensive rotational grazing system.
- Based upon the seasonal transmission of gastrointestinal nematodes on the study farm, devise a strategic treatment protocol that both minimizes economic losses and drug input. Assess effect of strategic treatment protocol upon subsequent parasite transmission.
- Assess the extent of similar parasite problems in Northeastern farms practicing intensive rotational grazing.

# Resource Conservation & Environmental Stewardship in the Maryland Ag in the Classroom Curriculum Guide

## Education

*A diverse group of conservation and agricultural organizations will collaborate to establish a model for sustainable agriculture education in the Chesapeake Bay region. The organizations will develop a regional curriculum guide and in-service workshops for teachers that combine information on the economic and social importance of agriculture with activities that demonstrate the need for environmental stewardship.*

### Abstract

This proposal is part of a three-year initiative to establish a regional curriculum guide and in-service workshops for Maryland teachers which combine information on the economic and social importance of agriculture with activities that demonstrate the need for resource conservation and environmental stewardship.

### Objectives

- 1) Develop environmental stewardship and resource conservation education components for the "Maryland Ag in the Classroom" curriculum guide, including new activities and field curricula related specifically to conservation issues and sustainable agriculture for incorporation into the AITC program.
- 2) Integrate information on agricultural practice and human lifestyle components to address critical issues in sustainability.
- 3) Implement AITC teacher inservice workshops with the added conservation components, incorporating new materials and provide ongoing support for these workshops.
- 4) Develop and implement extensive and intensive regional inservice workshops on sustainable agriculture with field and classroom components.
- 5) Provide follow-up and extension to teachers on a regional basis, developing models for statewide application.
- 6) Develop a regional and statewide network of farms and field sites to add hands-on components to "Ag in the Classroom" curricula incorporating stewardship/conservation;

### Coordinators:

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Phone: 410-822-4903

Robert Keenan  
Maryland Center for Agriculture,  
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### Participants:

Chesapeake Audobon Society  
Maryland Center for Agriculture  
Science and Technology  
Maryland Agricultural Educators'  
Consortium  
Talbot County Farm Bureau  
Maryland Extension Service  
UMd Eastern Shore  
USDA-Natural Resources  
Conservation Service

**SARE grant:** \$70,000

**Non-federal match:** \$66,450

**Project number:**  
LNE95-61



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**Project number:**  
LNE95-61

- 7) Establish inservice opportunities throughout the state for the staff of environmental education centers, farms and other field sites;
- 8) Create a model for collaborative curriculum development among diverse agencies.

Maryland Ag In The Classroom workshops have inserviced over 500 teachers in its 5-year history. Teachers have enthusiastically brought the activities and materials back to their classrooms and the

program is well received and supported. We expect to reach 250 teachers and 6000 students each year with the revised curriculum. Teachers are very receptive to new curriculum materials which reflect MSPAP outcomes and environmental education. We expect this program to be a very successful method of educating future voters and policy makers to promote agriculture and sustainable use of natural resources.

### Farmer To Farmer Directory

#### Education

*Participants will publish a directory of Maine producers who are implementing sustainable agricultural practices and systems on their farms. This grant continues funding for the project, which was first funded by SARE in 1991.*

#### Abstract

Surveys of conventional farmers have identified the lack of useful information as the major impediment to adoption of sustainable practices. Furthermore, farmers seeking information have difficulty in obtaining it from traditional sources such as Extension Educators or farm chemical and feed dealers. Surveys of farmers already using sustainable practices indicate that they have relied on other farmers for guidance. The conclusion is that the major barrier to conversion is identification and contact with enough successful growers.

The aim of the Directory is to augment the exchange of information by facilitating more contact between farmers. The directory includes short descriptions of individual sustainable practices or whole farm systems. Sustainable practices were identified by the major participants to write short descriptions of the practices. The descriptions have been incorporated into the Directory.

The indexes help users locate specific information. The Directory is indexed by county and by significant practices.

In order to further facilitate exchange between farmers at different stages of adoption of sustainable practices we have developed and sponsored annual farmer to farmer conferences. The heart of the conferences have been direct farmer to farmer exchange of information in addition to lectures and workshops. This SARE grant helped support the early conferences in 1992 and 1993. In November of 1994 and 1995 we held conferences that were nearly self supporting. Furthermore, we have now brought in the Extension as cosponsors of the conference, which widens the audience.

#### Coordinator:

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Maine Organic Farmers and  
Gardeners Association  
P.O. Box 2176  
Augusta, ME 04338

Phone: 207-622-3118

#### Participants:

Maine Organic Farmers and  
Gardeners Association  
University of Maine  
Cooperative Extension  
Maine Department of  
Agriculture

#### SARE grant:

\$3,000 for nine months

#### Matching funds:

\$600

#### Project number:

LNE94-41





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# 1995 Producer Grants

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**T**hirty-eight projects were selected for funding through the Northeast's 1995 Farmer/Grower Grant program. The 38 producer projects aim to diversify farms; develop direct and alternate markets, reduce purchased inputs; build, adapt and test innovative equipment; and use beneficial biology to control pest problems.

Many of the projects involve several producers who are working cooperatively to solve common problems. In total, \$95,838 was awarded to the farmer grant projects.

The program received 154 applications for funding from farmers in the 12-state region. The grants were selected on a competitive basis.

Each was reviewed by a panel of farmers and members of the Northeast Region SARE Administrative Council. Projects will conduct a field day or workshop, or produce a publication or video to share their results. All projects are required to provide matching funds and to submit a final report.

The following list provides a brief description of each project.

## Connecticut

- Peter Jacquier, of East Canaan, will work with four other farmers to organize a cooperative, multi-farm manure storage, solid separation, composting and digester system. The goal is to help these farms improve manure management and disposal practices and adapt new technologies to the small size of their farming operations. Grant: \$6,000. Project number: FNE95-88.

## Maine

- Gloria and Gregg Varney, of Turner, will research, document and evaluate the production and economic feasibility of once daily milking for a raw milk bottling operation. The Varneys will examine how once daily milking, in combination with rotational grazing, affects labor, overhead, feed production, herd health and overall farm profitability. Grant: \$4,990. FNE95-112.

- Michael Mcfarlane, of Ellsworth, will work to establish a commercially viable, organic cranberry bog, focusing on ways to promote maximum rooting, runner and upright growth with mulches, innovative planting methods and use of liquid seaweed as a rooting agent. Grant: \$2,080. FNE95-99.

- George James, of Easton, will evaluate the viability of incorporating carrot waste from a local vegetable processing plant into a feed product for horses. Grant: \$4,350. FNE95-89.

## Maryland

- Eric Rice, of Middletown, and Bill Hastings, organic growers in different climates in Maryland, will investigate the feasibility of growing annual strawberries and fall vegetables using sustainable practices. The project builds on a 1994 annual strawberry production demonstration at the University of Maryland's Wye Research and Education Center, and work being done by ARS. Grant: \$4,705. FNE95-104.

## Massachusetts

- Peter Konjoian, of Andover, will test the use of ethylene, a naturally occurring plant hormone, to stimulate branching and control flowering of floricultural greenhouse crops. A goal is to find alternatives to synthetic chemical growth regulators and to reduce labor costs. Grant: \$3,700. FNE95-94.

- Tim Coppinger, of Montague, plans to compost waste from a local supermarket with horse manure and sawdust. He will experiment with composting techniques,

*Producers are testing ways to diversify their farms, develop alternate markets, build innovative equipment, and use beneficial biology to control pests.*

## Producer Grants

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*Apple growers  
Elizabeth and Peter  
Ryan will test  
an alternative  
leaf-hopper  
control strategy.  
Their goal:  
to avoid  
late season  
pesticide  
applications.*

conduct chemical analyses to determine if there are pesticide residues in the compost, and evaluate environmental and safety issues. Grant: \$1,169. FNE95-81.

• Clifford Hatch, of Gill, along with another strawberry grower, will demonstrate alternative planting systems designed to reduce herbicide use, mechanical cultivation, hand hoeing and weeding. The two-year project is geared to respond to consumer and neighbor pressure to reduce pesticide use in Connecticut Valley operations, and will compare the systems' effectiveness at weed control, total expense and yields. Grant: \$6,215. FNE95-87.

• Susan Minnich, of Washington, will evaluate a woodland system for growing New England wildflowers and medicinal plants. The project attempts to respond to growing demand for these plants, and to develop a sustainable production system. Grant: \$1,850. FNE95-102.

• David Stanley, of Belchertown, will rear and release two naturally occurring caterpillar predators of major sweet corn pests, then examine their effectiveness at controlling European corn borer, fall army worm and corn ear worm in organic corn. He also will attempt to collect a third predator, a Ciccubekud beetle that masses in late-season tasseling corn, store it over the winter and use it the next season against Colorado potato beetles and European corn borers. Grant: \$3,525. FNE95-109.

### New Hampshire

• Klee Dugan, of Hillsboro, will test whether recirculating tank systems with solar domes can extend and prolong the growing season for New Hampshire fish farmers. Grant: \$3,936. FNE95-83.

• David Trumble, of Frankestown, will examine the most economically feasible way to grow greens, lettuce, spinach, flowers and herbs during the early spring and late fall. The project explores long-term solutions to season extension issues. Grant: \$1,575. FNE95-111.

### New Jersey

• Kay Magilavy, of Union City, with nine New York producers will establish a farmer-to-farmer mentoring program to assist in the start-up of organic operations. The advisory service will help new — and transitioning — farmers as they create a farm plan and during the first growing season. Grant: \$5,400. FNE95-100.

• Ed Lidzbarski, of Jamesburg, working with other farmers, Rutgers University personnel, and local wholesalers, will develop an organic tomato production and marketing manual. This project builds on a previous New Jersey Agriculture Department and NOFA New Jersey initiative that successfully developed uniform packaging systems and established a market for organic tomatoes. Grant: \$4,935. FNE95-96.

### New York

• George and Heidi Kollias, of Freeville, will test the feasibility of using predator scents to control deer damage to Christmas trees. The predator scents will be compared to conventional chemical repellents and soap sprays. Grant: \$960. FNE95-93.

• Robert Schultz, of Jamestown, will use chopped newspaper as a mulch in tomato production systems. The project aims to recycle a waste and reduce the use of pesticides and plastic mulches. Grant: \$612. FNE95-107.

• Klaas and Mary-Howell Martens, of Penn Yan, will use soil conserving, organic production methods to establish trellised plantings of hardy kiwi, a smaller-fruited, fuzzless relative to the kiwi fruit. Grant: \$1,078. FNE95-101.

• Carole Corcoran, of Westhampton, will build and test modular row-cover structures aimed at extending the growing season and reducing flea beetle damage to arugula and other leafy greens. Grant: \$633. FNE95-82.

• R. Peter Childs, of Humphrey, will experiment with harvest and marketing methods for Chinese chestnuts. Grant:

## Producer Grants

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\$2,400. FNE95-80.

- James P. Barney, of Sherman, will compare the economics of growing and feeding grass-based forage crops with alfalfa/corn rotations for dairy farmers in the southern tier of western New York. Barney's two-year project will track yields, feed quality and costs. Grant: \$3,050. FNE95-78.

- Jeanne L. Giambrone, of Little Valley, will explore ways to extend the growing season for vegetable crops grown for sale at farmers' markets. The project will examine early and late protection methods, choice of varieties, timing, and pest management considerations using IPM methods. Grant: \$1,200. FNE95-85.

- Jim Lucey, of Belmont, will build and assess a "cover crop undercutter" for use in three small vegetable crops. The undercutter will be based on a design developed at Ohio State University but not being commercially manufactured. Grant: \$1,150. FNE95-98.

- Craig Kawasaki, of E. Moriches, will test a predatory mite for control of twospotted spider mites in his greenhouse. His project is designed to help greenhouse growers of ornamental plants learn about using beneficial biology to control pests. Grant: \$500. FNE95-90.

- Aaron Gabriel, of Schaghticoke, will test two alternate methods for controlling flea beetle damage to spring broccoli. Gabriel will use commercially available nematodes which are labeled for controlling flea beetle larvae in the soil, and Chinese cabbage as a trap crop for controlling adult flea beetles. Grant: \$850. FNE95-84.

- Elizabeth and Peter Ryan, of Staatsburg, will test the use of a single thinning application of carbaryl shortly after petal fall as an alternative control strategy for leaf hoppers. Preliminary trials at the New York State Agricultural Experiment Station suggest this strategy can significantly reduce egg laying adults and second generation nymphs, thus reducing the need for additional pesticide applications later in the season. Grant: \$2,275. FNE95-106.

- Sue Smith-Heavenrich, of Candor, will evaluate methods for encouraging spiders through the use of mulch in potatoes and other crops. This project continues a 1994 study suggesting that mulches can encourage spider populations, which in turn may control leafhopper populations. Grant: \$938. FNE95-108.

### Pennsylvania

- Harry Karl Zimmerman, of Kintnersville, will evaluate the economic feasibility of producing greenhouse strawberries for the local (southeastern Pennsylvania) market. This project continues a 1994 SARE-funded project. Grant: \$1,075. FNE95-115.

- Edgar H. Rits, of Honey Grove, will expand direct sales of sustainably produced beef in the Harrisburg area and offer customers the opportunity to visit the farm on which their food was produced. Grant: \$1,304. FNE95-105.

- Jim Weaver, of Wellboro, will develop and test a quick, inexpensive method for determining protein content of pastures used for rotationally grazing cows. The goal is to provide graziers with information on pasture quality to make timely management decisions that will enhance grazing performance. Grant: \$2,610. FNE95-113.

### Vermont

- John Williamson will grow sweet sorghum in southern Vermont using maple sugaring equipment to process it into syrup. The goal is to determine whether sorghum syrup could be an additional cash crop for maple producers. Grant: \$1,750. FNE95-114.

- Todd Pinkham, of Johnson, will build and test a facility integrating an existing heifer barn and modern greenhouse, with the aim of using heat from the heifer barn to warm the greenhouse. The project seeks to demonstrate energy and nutrient-savings as a result of the integration and diversification. Grant: \$779. FNE95-103.

- Rob Litch, of New Haven, will assist

*Vermont farmer  
Jack Lazor  
will develop  
low-cost  
machinery to  
overseed clovers  
and other  
green manure crops  
into existing  
plant stands.*

## Producer Grants

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*Pennsylvania  
farmer Jim Weaver  
will develop a  
quick, inexpensive  
field test  
for determining  
protein content  
of pastures used  
for rotationally  
grazing cows.  
The goal: to  
help graziers with  
timely management  
decisions.*

other poultry growers with economically viable methods to transport birds to a regional processing plant. The project aims to improve small-scale producers' access to processing plants; reduce damage, disease and mortality; and enhance profitability. Grant: \$3,025. FNE95-97.

- Joseph Klein, of Plainfield, will test the use of pastured chickens to control Colorado potato beetles. Grant: \$1,050. FNE95-92.

- Jonathan Blumberg, of East Thetford, will develop an environmentally benign and cost-effective method of hop production through a soil improvement and fertilization program, use of legume cover crops and secondary intercrops, and efficient hop cultural techniques. Grant: \$5,970. FNE95-79.

- Chuck Armstrong, of Brownsville, will evaluate two bacterial biofungicide seed treatments in vegetable crops, comparing them to chemical fungicide and to no treatment. The project aims to explore an alternative to chemical fungicide treatments, particularly for crops that are susceptible to poor performance in cool spring soils. Grant: \$1,250. FNE95-77.

- Judith Hall, of Belmont, will evaluate low-maintenance turfgrass and various mulches as alternatives to cultivation in cut flower production systems. Grant: \$2,482. FNE95-86.

- Jack Lazor, of Westfield, will develop low-cost machinery to overseed clovers and other green manure crops into existing plant stands. His goal is to provide practical, economical methods to farmers to maintain and build soil health and productivity. Grant: \$4,348. FNE95-95.

### West Virginia

- Pam Talley, of Caldwell, will evaluate a living mulch system for cut flower production. Talley's goal is to explore alternative weed control methods that reduce chemical herbicide use, and contribute to soil quality and conservation. Grant: \$1,605. FNE95-110.

# Addressing the Needs of Extension Faculty and Staff through a New York State Cover Crop Symposium

## Professional Development

*In response to a renewed producer, researcher and extension interest in cover crops, this project will hold a one-day symposium highlighting current research across all commodities.*

### Abstract

Researchers, extension staff and growers in New York State have shown a renewed interest in cover crops. Over the past few years, several SARE grants were funded in New York State looking at ways to increase their utilization across commodities. Although useful information has been collected and disseminated throughout the state, it has often been limited by commodity. Those working in vegetable crops, for example, are aware of work in that field. They are likely to lack information on cover crop utilization in other commodities however — information that may be useful in their field. There has been no comprehensive effort to bring all of the New York State programs and several of the NE projects together to review the status of cover crop research in the state.

On November 15, 1995, a one day cover crop symposium will be conducted in Ithaca, NY. More than 60 Cornell Cooperative Extension faculty and staff with expertise in fruit, vegetables, field crops and landscape horticulture will attend to hear and share the latest information on cover crops. Cover crops as they relate to soil structure, nutrient management, pest management and production systems were discussed by New York State growers as well as experts from Cornell, Maine and Quebec, Canada. With the training and resources received at the symposium, field agents are better able to access cover crop information, answer growers questions and concerns, and improve their expertise on the subject.

### Coordinator:

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Horticultural Sciences  
New York State Agricultural  
Experiment Station  
Geneva NY, 14456

Phone: 315-787-2311

### Grant:

\$5,700

### Match:

\$6,369

### Project number:

ENE95-6





# Information Management Training for Integrated Crop and Pest Management

Professional Development

*This two-year project will conduct a series of education and training activities to improve the ability of public agency personnel to provide IPM and ICM technical assistance to producers.*

### Abstract

Integrated pest management (IPM) strategies and methods created by land grant university research and extension over the last 20 years have emerged as the most powerful tools for managing agricultural pests for successful crop production while protecting environmental quality. More recently, integrated crop management (ICM) has been added to assist and engage farm operators in systematically planning whole-farm management — evaluating all resources and inputs — while emphasizing nutrient management to protect water quality.

Yet, adoption of ICM/IPM is restricted to a few crops and farm operations, and is rarely used on whole farms, especially by horticultural producers. Adoption and delivery are hindered by the complexity of multiple crop and pest relationships on a single farm, the time and skills required of growers and agricultural professionals, and by the lack of qualified trained crop advisors.

Three education and training activities are proposed over a two-year period to improve the ability of public agricultural support professionals to create and offer grower whole-farm ICM/IPM technical assistance programs.

First, relevant ICM/IPM literature and experiences will be reviewed in a systematic way; reducing the volume of information and preparing teaching tools for field use by agricultural support professionals. Educational resources currently appear in published journals, in extension publications that are only distributed locally, and in handouts used by trainers, practitioners and others. The project will develop abstracted references, a searchable database, condensed resource lists, sample scouting guides, condensed lists of available IPM thresholds, sample ICM farm plans for participation in voluntary or government programs, referral guides for other USDA agency

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University of Delaware  
North Jersey Resource  
Conservation Development  
Council

### Grant:

\$59,508

### Match:

\$104,000

### Project number:

ENE95-7



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**Project number:**  
ENE95-7

personnel, and other materials.

Second, a training program will be prepared for 150-300 agricultural professionals and agency personnel in two states, and conducted during the second year. Evaluations will determine the value of this training for other states.

Third, selected electronic, mechanical, or hand-held tools and methods will be evaluated in the field over two growing seasons to help agricultural professionals more efficiently gather, manipulate and share IPM information. Recommendations will be prepared and shared in the region. Improving the efficiency, speed and simplicity of gathering and sharing IPM information —

directly from the field to grower — is essential to expand current programs in a region where small farm/field sizes, wide variety of crops, and travel time between fields broken by suburban development all combine to make delivery of IPM field monitoring cost-prohibitive for public and private field monitoring programs.

The major participants are well-suited for this task due to extensive experience creating and training for ICM/IPM programs on high value horticultural crops which dominate the most profitable sectors of agriculture in the region.

# New England Extension Sustainable Agriculture Training Program

## Professional Development

*This New England-wide, participatory project continues work begun in 1994 to educate extension and other agency personnel in sustainable farming methods and to further the adoption of more sustainable farming systems throughout the region. Project goals also include identifying information needs and developing skills to address complex community issues.*

### Abstract

The New England Extension Sustainable Agriculture Training Program began in the spring of 1994. SARE Chapter 3 funding enabled an energetic network, composed of a cross-section of extension personnel and farmer-based organizations from around New England, to work together in carrying out the first year's activities. The focus of the first year was a regional educational process, to culminate in a participatory conference on sustainable agriculture scheduled for March 29-30, 1995. Expected outcomes from the first year of the project are: the identification and sharing of sustainable agriculture expertise; practical, "cutting-edge" technical training for participants, including analysis of methods for integrating this information into whole production systems; identification of resource needs and a plan to develop such resources; and development of skills in participatory educational techniques. The network includes extension system representatives from all 6 New England states, the New England Cooperative Extension Consortium, the Maine Organic Farmers and Gardeners Association (MOFGA), and the Northeast Organic Farming Association of Vermont.

The two-year project will to a) implement strategies identified through the first year to further develop skills in sustainable farming methods through a participatory process involving farmers and agencies; and b) continue to build capacity for the regional agency/farmer network to work together toward a more viable sustainable farming system in New England.

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University of Massachusetts  
University of New Hampshire  
University of Maine  
University of Rhode Island  
New England Cooperative  
Extension Consortium  
Maine Organic Farmers and  
Gardeners Association  
Northeast Organic Farming  
Association chapters

### Grant:

\$119,613

### Project number:

ENE95-8



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**Project number:**  
ENE95-8

The long-term goal of the New England training project is to increase the ability of the extension system and other federal agencies (the Natural Resources Conservation Service and Farm Services Agency) and farmers in the six New England states to develop and maintain sustainable agriculture, protect the natural environment, and strengthen rural communities. Specific objectives to meet this goal are as follows:

1. Establish more effective networks among farmers, extension specialists and other agency personnel for teaching, and for planning and conducting research;
2. Increase knowledge about sustainable agriculture and about specific sustainable farming techniques and whole-farm systems analysis.
3. Identify information needs of farmers in New England and develop educational materials and further training and educational programs.
4. Develop skills to address complex community issues relating to agriculture and to increase awareness among community members about the importance of maintaining New England's agricultural base.

# A Video Training on Cultivation Featuring Talented Farmers and their Weed Control Machines

Professional Development

*Participants will produce a high-quality video describing cultivation equipment, techniques and tactics. Copies of the video will be available for Extension workers throughout the Northeast.*

### Abstract

Two high-quality videos describing cultivation equipment, techniques, and tactics are proposed. These 45-minute videos will be educational and reference tools for extension personnel and other agencies in the Northeast who work with crop farmers.

This resource is needed because extension personnel lack sufficient knowledge about the technical aspects of cultivation to adequately advise organic growers as well sustainable and conventional growers interested in shifting from herbicides to cultivation. Cultivation is the most economical and effective alternative to herbicides and is becoming increasingly important to the operations of most vegetable growers. Regulatory and logistical pressures such as difficulty in obtaining labor, loss of herbicides for minor crops, and rotation considerations are causing growers to move toward non-chemical weed management practices. Growers presently have difficulty in obtaining detailed information on cultivation from extension and other sources. Extension personnel need exposure to what can be done with cultivation, and they need materials to use as resources in educating farmers. Video allows demonstrations of a variety of equipment in action. The two-part video proposed will be narrated by farmers. The farmers chosen for the videos are experienced cultivators from Massachusetts, Vermont, and New Hampshire. These farmers will demonstrate a range of commonly-used and innovative equipment, discuss use and adjustment of these machines, and impart ideas on strategies for cultivating that produce effective, economical weed control.

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### Participants:

University of Vermont  
University of Massachusetts  
Massachusetts and Vermont  
farmers

### Grant:

\$14,560

### Match:

\$2,944

### Project number:

ENE95-9





# Education of Extension Workers in Sustainable Agriculture Practices Utilizing the PASA Conference and Farm Visits

Professional Development

*This project will use the annual Pennsylvania Association for Sustainable Agriculture (PASA) conference to educate 30 extension agents and specialists. Participants will attend a pre-conference workshop on sustainable agriculture concepts and a post-conference meeting to synthesize conference activities and learning and develop strategies to enhance sustainable agriculture education. During the summer months, extension personnel will tour farms in Pennsylvania where farmers are adopting sustainable practices.*

### Abstract

The education of Pennsylvania Extension Workers in Sustainable Agriculture Practices will occur at the annual conference of the Pennsylvania Association for Sustainable Agriculture. This conference served as a resource to increase awareness of and knowledge about sustainable agriculture among a core group of Pennsylvania Extension Agents and Specialists. Agents will use what they learned at the conference to incorporate what they have learned in sustainable agriculture practices into their own plans of work.

During the summer extension personnel will tour demonstrations in Pennsylvania which demonstrate the progression of adoption of sustainable practices. Tours are planned for June and July.

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### Participants:

Pennsylvania State University  
Rodale Institute  
Pennsylvania Association for Sustainable Agriculture

### Grant:

\$35,000

### Match:

\$19,778

### Project number:

ENE95-10





# On-Farm Research and Extension Education Program

## Professional Development

*Through this two-year project, groups of extension agents in each of the state's five extension regions will use on-farm experimental techniques to obtain accurate information that is credible to scientists and farmers.*

### Abstract

The On-farm Research and Extension Education Program will train extension educators, farmers and interested USDA field staff in skills needed to advance the adoption of sustainable agriculture practices. It will take advantage of a resource person who is knowledgeable about on-farm research and demonstration methods, has 15 years of Cooperative Extension experience, and is an active member of the state's non-profit sustainable agriculture association. Funds provided by the project will enable the project coordinator to work on a half-time basis conducting the program. Several sustainable agriculture activities currently in place in Pennsylvania will form a strong basis for this proposal to train at least one-third of the agricultural agents in the state.

Over a period of two years, groups of extension agents in each of the state's five extension regions will be trained in reliable experimental technique. Methods are available to obtain accurate information that is credible to both scientists and farmers. Farmers will collaborate with the extension agents in the planning, implementation, interpretation and dissemination steps of the on-farm experiments. Opportunities for analyzing the interaction of several components in a farm system and comparisons of whole-farm systems will take place.

At the end of each year, methods used will be evaluated by the participating agents, farmers, and USDA staff to determine their usefulness. The participants themselves will be evaluated as to their acceptance of farm practices demonstrated and researched that contribute to the sustainability of farms and the enhancement of environmental quality.

Training materials, research reports, videotapes and other materials will be developed and refined for use by others after

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### Participants:

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Pennsylvania Association for  
Sustainable Agriculture  
USDA Natural Resources  
Conservation Service

### Grant:

\$90,373

### Match:

\$34,660

### Project number:

ENE95-11



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**Project number:**

ENE95-11

project completion. It is estimated that at least one half year will be needed to refine the materials and produce final reports after the second year of training and on-farm trials.

# Farming in Northeast Communities: An Integrated Approach to Planning for the Future

## Professional Development

*This project will provide extension personnel, USDA agency field staff and others with training, resource materials and assistance in facilitating community-level dialogue about agricultural issues and community-based planning and development projects to sustain local farming.*

### Abstract

Extension field staff and other agricultural educators are positioned to play a lead role in helping communities address the complex issues and opportunities facing agriculture in the Northeast. Although many are lacking the skills and experience of working with diverse local stakeholder groups, they increasingly recognize that effective communication and collaboration between farmers and non-farmers will be critical for the future of farming in Northeast communities.

This three-year project will provide extension personnel, USDA agency field staff and others with training, resource materials, and assistance in: 1) facilitating community-level dialogue to address agricultural issues and 2) facilitating community-based strategic planning and development projects to sustain local farming. As a result of this project, participants will be better prepared to provide leadership to a wide range of community-based agriculture development initiatives, including for example: addressing local "agricultural illiteracy"; helping farmers and non-farmers work together to address water quality issues in the community; working with local restaurants and institutions to promote the purchase of locally grown and raised farm products; organizing a farmers market or a marketing cooperative; promoting local agritourism; organizing local farmer-to-farmer learning networks; improving farmer-neighbor relations; and identifying new local and regional marketing opportunities.

Project activities include:

1) annual in-service training workshops on how to organize successful community-based dialogue on agricultural issues, and

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Agriculture Working Group  
Northeast Organic Farming  
Association of New York  
USDA-Natural Resources  
Conservation Service  
Other agencies non-  
governmental organizations  
and agricultural businesses

### Grant:

\$121,732

### Project number:

ENE95-12



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**Project number:**  
ENE95-12

- how to conduct strategic planning and agriculture development projects;
- 2) follow-up consultations and assistance as needed to help people put training into practice;
  - 3) study tours for extension and other agricultural and community leaders to learn firsthand about innovative community agriculture development strategies;

- and,
- 4) production of resource materials on how to organize successful community-based dialogue on agricultural issues and how to conduct strategic planning and agriculture development projects, for use by people working with diverse stakeholders in local communities.

# Whole-Farm/Whole-Watershed Planning For Sustainable Agriculture

## Professional Development

*This project will provide an in-depth, intensive educational experience for extension and USDA agency staff who work with farm clients on whole-farm and whole watershed planning.*

### Abstract

This project has been designed to provide an in-depth, intensive educational experience for extension and USDA-Natural Resources Conservation Service staff that interact directly with farm clientele in whole-farm/whole-watershed planning. The series of meetings will begin by introducing concepts of holistic planning to broaden the vision of these professionals outside of their technical expertise. Speakers will be brought in to cover cultural, social, economic and environmental implications of the planning process. The goal is to increase the professionals' comfort level in being able to communicate these aspects of decision-making to clientele. The next phase is to set up interdisciplinary teams that will address real-life situations, apply presently available computer system approaches to planning, and discuss and analyze those components not addressed by existing software. Finally, these teams will all be brought together to discuss their findings in a study circle and will produce an on-farm checklist that can be used in the future to facilitate whole-farm planning and to address the issues commonly overlooked by more traditional approaches. Additionally, participants will improve their working relationships with one another, develop new skills, gain an understanding of the perspectives of others and learn new methods for site specific planning that explicitly address the protection and improvement of off-site environments. Videotapes will be made of the invited speakers and disseminated to provide further educational programs for those unable to attend the training. Participants will also be invited to attend a NRCS-sponsored Ecosystem-Based Assistance training for working with landowners/users. It is expected that each participant will be able to use the expertise gained through this training to help clientele move farther along the path to sustainable production.

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USDA-Natural Resources  
Conservation Service

### Grant:

\$13,500

### Match:

\$4,600

### Project number:

ENE95-13





# Promoting Sustainable Agriculture Through a Systems Approach to Consensus Building and Public Policy Education

Professional Development

*Extension and other USDA field personnel will learn consensus-building and public policy education skills as they relate to sustaining agriculture and a healthy environment in the Northeast.*

### Abstract

A systems approach to consensus building and public policy education (CB/PPE) is proposed to enhance the likelihood of an economically viable and sustainable agriculture. The need for such an approach is particularly acute in the densely populated states of the Northeast where high land values, taxes, and costs associated with environmental regulation and compliance have forced many industries, including agriculture and ag-related corporations to terminate business or leave the region in search of more favorable environments.

Extension educators and USDA personnel can play a significant role in developing a systems approach because many have already established credibility as mediators through their record of service and work with individuals and groups who are directly affected by public policy issues. However, as the issues and practices involving environmental protection, sustainable agriculture and public policy development have become increasingly complex, extension educators and USDA personnel have recognized the need for improved and expanded training in public policy, consensus building, and conflict resolution strategies.

Guided by a multidisciplinary project advisory committee from the Northeast, project investigators will train and educate Extension and other USDA field personnel in CB/PPE skills as they relate to promoting sustainable agriculture and a healthy environment. By the end of the project participants will be able to: identify and explain key issues related to sustainable agriculture and the role of agriculturalists as environmentalists; identify and describe the basic elements of CB/PPE models and skills; demonstrate and apply CB/PPE skills in simulation exercises based upon real-life problems, such as conflicts involving resource

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University of New Hampshire  
Cornell University

### Grant:

\$27,098

### Match:

\$60,500

### Project number:

ENE95-14



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**Project number:**

ENE95-14

utilization, zoning and planning, property rights, and rural/urban interface; develop and implement CB/PPE forums, programs and/or strategies appropriate to their respective work-settings to facilitate improved commu-

nication, understanding and dispute resolution; and assist in the training and educating of other colleagues, community leaders, and constituencies who may wish to join them in CB/PPE endeavors as they arise.

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